

Claims

1. An object of value with a security element, the security element having at least a first and a second liquid-crystalline material, characterized in that the first material has thermochromic properties and the second material an optically variable effect.
2. An object of value according to claim 1, characterized in that at least one of the liquid-crystalline materials polarizes light selectively.
3. An object of value according to claim 1 or 2, characterized in that the first and second materials polarize light differently.
4. An object of value according to at least one of claims 1 to 3, characterized in that the first material polarizes light right-handed and the second material polarizes light left-handed or vice versa.
5. An object of value according to at least one of claims 1 to 4, characterized in that the optically variable effect is a color shift effect.
6. An object of value according to at least one of claims 1 to 5, characterized in that the thermochromic material is applied all over.
7. An object of value according to at least one of claims 1 to 5, characterized in that the thermochromic material is provided only in certain areas.
8. An object of value according to claim 7, characterized in that the thermochromic material is provided in the form of characters and/or patterns.
9. An object of value according to at least one of claims 1 to 8, characterized in that the thermochromic material is disposed above or below the material with an optically variable effect.
10. An object of value according to at least one of claims 1 to 8, characterized in that the thermochromic material is disposed beside the material with an optically variable effect.

11. An object of value according to at least one of claims 1 to 10, characterized in that an at least partly dark, preferably black, background is present below the liquid-crystalline materials.
12. An object of value according to claim 11, characterized in that the background is dark all over.
13. An object of value according to claim 11, characterized in that the background is present in the form of patterns and/or characters.
14. An object of value according to at least one of claims 11 to 13, characterized in that the background is printed, produced by coloring a substrate or by laser.
15. An object of value according to at least one of claims 1 to 14, characterized in that one of the materials, the background and/or a further layer has properties that are testable visually and/or by machine.
16. An object of value according to at least one of claims 1 to 15, characterized in that the thermochromic material is colored below a predetermined temperature and transparent or at least translucent above said temperature.
17. An object of value according to at least one of claims 1 to 15, characterized in that the thermochromic layer is at least translucent or transparent below a predetermined temperature and colored above said temperature.
18. An object of value according to at least one of claims 1 to 17, characterized in that the security element is a label.
19. An object of value according to at least one of claims 1 to 17, characterized in that the object of value is a security paper, a security document or a product package.
20. An object of value according to at least one of claims 1 to 19, characterized in that at least part of the security element is covered with a protective layer.

21. A security element for protecting objects of value, the security element having at least a first and a second liquid-crystalline material, characterized in that the first material has thermochromic properties and the second material an optically variable effect.
22. A security element according to claim 21, characterized in that the first and second materials polarize light differently.
23. A security element according to claim 21 or 22, characterized in that the optically variable effect is a color shift effect.
24. A security element according to at least one of claims 21 to 23, characterized in that the thermochromic layer is transparent or at least translucent below a predetermined temperature and colored above said temperature.
25. A security element according to at least one of claims 21 to 24, characterized in that the security element is a security thread.
26. A transfer material for producing a security element, characterized in that the transfer material has a carrier material on which at least a first and a second liquid-crystalline material are disposed, characterized in that the first material has thermochromic properties and the second material an optically variable effect.
27. A transfer material according to claim 26, characterized in that the transfer material is formed as a hot stamping foil.
28. A method for producing an object of value or security element, characterized in that
 - a substrate is provided,
 - thermochromic liquid-crystalline material and liquid-crystalline material with an optically variable effect are applied to said substrate.
29. A method according to claim 28, characterized in that
 - a) the substrate has an at least partly black layer or surface,

- b) the thermochromic material is applied thereabove in the form of characters and/or patterns, and
 - c) the liquid-crystalline material with an optically variable effect is applied thereabove; or
 - d) the substrate has an at least partly black layer or surface,
 - e) the liquid-crystalline material with an optically variable effect is applied thereabove, and
 - f) the thermochromic material is applied thereabove in the form of characters and/or patterns.
30. A method for testing an object of value, characterized in that it is checked
- whether a color shift effect and
 - a thermochromic effect are present.
31. A method according to claim 30, wherein it is additionally checked whether the polarization effects are present.

Abstract

The invention relates to an object of value with a security element having at least a first and a second liquid-crystalline material, the first material having thermochromic properties and the second material an optically variable effect.

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